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- ☒ 2. **filtering the roughness of a sanded wood surface**  
By: Gurau, Lidia; Mansfield-Williams, Hugh; Irle, Mark  
HOLZ ALS ROH-UND WERKSTOFF Volume: 64 Issue: 5 Pages: 363-371 Published: OCT 2006  
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- ☐ 3. **Effect of sanding on surface roughness of rubberwood**  
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**Record 1 of 38****Title:** Experimental Study on Drilling MDF with Tools Coated with TiAlN and ZrN**Author(s):** Szwajka, K (Szwajka, Krzysztof); Zielinska-Szwajka, J (Zielinska-Szwajka, Joanna); Trzepiecinski, T (Trzepiecinski, Tomasz)**Source:** MATERIALS **Volume:** 12 **Issue:** 3 **Article Number:** 386 **DOI:** 10.3390/ma12030386 **Published:** FEB 1 2019

**Abstract:** There is increasing use of wood-based composites in industry not only because of the shortage of solid wood, but above all for their better properties such as: strength, aesthetic appearance, etc., compared to wood. Medium density fiberboard (MDF) is a wood-based composite that is widely used in the furniture industry. The goal of the research conducted was to determine the effect of the type of coating on the drill cutting blades on the value of thrust force (F-t), cutting torque (M-c), cutting tool temperature (T) and surface roughness of the hole in drilling MDF panels. In the tests, three types of carbide drills (HW) were used: not coated, TiAlN coated and ZrN coated. The measurement of both the thrust force and the cutting torque was carried out using an industrial piezoelectric sensor. The temperature of the cutting tool in the drilling process was measured using an industrial temperature measurement system using a K-type thermocouple. It was found that the value of the maximum temperature of the tool in the drilling process depends not only on the cutting speed and feed rate, but also on the type of coating of the cutting tool. The value of both the cutting torque and the thrust force is significantly influenced by the value of the feed rate and the type of drill coating. The effect of varying plate density on the surface roughness of the hole and the variation of the value of the thrust force is also discussed. The results of the investigations were statistically analyzed using a multi-factorial analysis of variance (ANOVA).

**Accession Number:** WOS:000460768000055**PubMed ID:** 30691121**Author Identifiers:**

Author	Web of Science ResearcherID	ORCID Number
Szwajka, Krzysztof	H-7524-2019	0000-0002-1038-1148
Trzepiecinski, Tomasz	H-7069-2013	0000-0002-4366-0135

**ISSN:** 1996-1944**Record 2 of 38****Title:** Determination of the Effect of Cutting Direction and Grit Sizes of the Abrasive on Surface Roughness of Scotch Pine (*Pinus sylvestris* L.) and Oriental Beech (*Fagus orientalis* L.) Woods**Author(s):** Demirci, S (Demirci, Selcuk)**Source:** KASTAMONU UNIVERSITY JOURNAL OF FORESTRY FACULTY **Volume:** 19 **Issue:** 2 **Pages:** 164-172 **DOI:** 10.17475/kastorman.626270 **Published:** 2019

**Abstract:** Aim of the study: In this study; effects of the grit size of abrasive and cutting direction on surface quality of sanded Scotch pine and Oriental beech woods were investigated.

Material and Methods; Scotch pine and Oriental beech which are commonly used in furniture sector were chosen. Specimens were sanded with three different grit sizes of abrasives; namely, 40, 60, and 80-grit. The surface roughness of specimens was measured using Mitutoyo Surfest SJ-301 stylus scanner device on the basis of TS 2495 EN 3274 and TS 6956 EN ISO 4287. In total, 36 test samples were used for the experiments and each specimen was divided into eight equal parts and two measurements were made perpendicular to grain at 20 mm length.

Main results: The smoothest surface was obtained from the Scotch pine when sanded at tangential section with 80-grit abrasives. The roughest surface was obtained from the Oriental beech when sanded at tangential section with 40-grit abrasives.

Highlights: Especially, in the production of wooden furniture; after the wood materials are cut with circular saws, smooth surfaces can be obtained by sanding them with a 60 and 80-grit abrasives without planing. This will provide economic benefits to producers.

**Accession Number:** WOS:000490940100003**ISSN:** 1303-2399**eISSN:** 1303-4181**Record 3 of 38****Title:** EVALUATING OF WETTING-INDUCED EFFECTS ON THE SURFACE STABILITY OF SANDED WOOD**Author(s):** Magoss, E (Magoss, Endre); Molnar, Z (Molnar, Zsolt); Suri, V (Suri, Veronika); Fuchs, I (Fuchs, Ingrid)**Source:** WOOD RESEARCH **Volume:** 64 **Issue:** 3 **Pages:** 401-410 **Published:** 2019

**Abstract:** A sanding is a common woodworking operation to smooth the surface prior to apply surface finish or coating materials. All cutting processes damage the upper layer of wood surface and sanding also creates a deformation zone. This deformation zone is sensitive to artificial or environmental actions, especially to wetting. In order to determine the effect of wetting on the surface properties, to get insight into the dynamics of surface movement as a function of time during the wetting, special 3D surface roughness measurements were carried out and evaluated. For sanding of samples the most common grit sizes were selected and P100 and P180 sand papers were used. Measuring the weight of the samples the dynamics of evaporation of the applied water was also determined.

The surface modification after wetting is caused by moisture gradients in the upper layer associated with swelling and shrinkage resulting in permanent deformations. For this layer the most characteristic roughness parameters are the average roughness S-a and the Abbott parameters S-pk, S-k and S-vk. The extent of roughness variation due to wetting is characterised by the ratio of roughness after wetting to the initial roughness value.

The measurement results have shown that the simultaneous infiltration and evaporation rate has a definite influence on the surface roughness modification.

The most stable wood species with the least modification were the ring-porous species, following by the diffuse-porous and conifers species. The evaporation rate measured followed the same sequence for wood species investigated.

**Accession Number:** WOS:000475298300003**ISSN:** 1336-4561**Record 4 of 38****Title:** Optimization of CNC cutting parameters using design of experiment (DOE) and desirability function**Author(s):** Hazir, E (Hazir, Ender); Erdinler, ES (Erdinler, Emine Seda); Koc, KH (Koc, Kucuk Huseyin)**Source:** JOURNAL OF FORESTRY RESEARCH **Volume:** 29 **Issue:** 5 **Pages:** 1423-1434 **DOI:** 10.1007/s11676-017-0555-8 **Published:** SEP 2018

**Abstract:** In this study, 2(5) (five factors at two-level factorial design) design of experiment was applied to investigate a set of optimal machining parameters to achieve a minimum surface roughness value for *Abies nordmanniana*. Wood specimens were prepared using different values of spindle speed, feed rate, depth of cut, tool radius, and cutting directions. Average surface roughness values were applied using a stylus. The objectives were to: (1) obtain the effective variables of wood surface roughness; (2) analyze which of these factors had an impact on variability in the CNC machining process; (3) evaluate the optimal cutting values within the range of different cutting levels of machining parameters. The results indicate that the design of experiment (DOE) based on the desirability function approach determined the optimal machining parameters successfully, leading to minimum R (a) compared to the observed value. Minimum surface roughness values of tangential and radial cutting directions were 3.58 and 3.21 A mu m, respectively.

**Accession Number:** WOS:000438857300028

**Author Identifiers:**

Author	Web of Science ResearcherID	ORCID Number
hazir, ender	P-3494-2018	0000-0002-8998-4450
hazir, ender	O-1311-2019	0000-0002-8998-4450
Koc, Kucuk Huseyin	S-8446-2018	0000-0001-6370-2016

**ISSN:** 1007-662X

**eISSN:** 1993-0607

#### Record 5 of 38

**Title:** Surface roughness in relation to altitude or hornbeam wood

**Author(s):** Kiaei, M (Kiaei, Majid); Paloj, RM (Paloj, Rasoul Mosavi)

**Source:** MADERA Y BOSQUES **Volume:** 24 **Issue:** 1 **Article Number:** UNSP e241964 **DOI:** 10.21829/myb.2018.241964 **Published:** SPR 2018

**Abstract:** Hornbeam wood (*Copiosus betulus*) is a native species from Iran and covers 33% of the commercial volume of Iranian woods. Surface quality of solid wood products is one of the most important properties influencing further manufacturing processes such as finishing or strength of adhesive joint. Wood surface roughness is affected by growth condition. The objective of this study was to evaluate effect of altitude index (400 m, 800 m and 1200 m) on the surface roughness of sanded hornbeam wood (*C. Betulus*). Surface characteristics of sanded specimens of hornbeam wood were made employing a stylus profilometer. Average roughness ( $R_a$ ), mean peak-to-valley height ( $R_z$ ), root-mean square deviation of the profile ( $R_q$ ), core roughness depth ( $R_k$ ), reduced peak height ( $R_{pk}$ ), and reduced valley depth ( $R_{vk}$ ) roughness parameters were used to determine surface characteristics of the test pieces. Significant statistical differences were found among altitude indexes in reduced valley depth parameter and wood oven-dried density, but not for the other variables. This variable did not have significantly effect on other surface roughness parameters in hornbeam wood. The low altitude had a rougher surface than intermediate and high altitudes. There is no relationship between surface roughness parameter and wood oven-dried density.

**Accession Number:** WOS:000448675600001

**ISSN:** 2448-7597

#### Record 6 of 38

**Title:** Distinctive Impact of Processing Techniques on Bonding Surfaces of Acetylated and Heat-Treated Beech Wood and Its Relation to Bonding Strength

**Author(s):** Lutkemeier, B (Lutkemeier, Bernd); Konnerth, J (Konnerth, Johannes); Militz, H (Militz, Holger)

**Source:** FOREST PRODUCTS JOURNAL **Volume:** 68 **Issue:** 4 **Pages:** 372-382 **DOI:** 10.13073/FPJ-D-17-00077 **Published:** 2018

**Abstract:** In this study, the tensile shear strength of untreated, acetylated, and heat-treated beech (*Fagus sylvatica* L.) wood joints was investigated as a function of different surficial processing techniques. It was hypothesized that differentiating patterns of surface texture are induced by specific processing techniques directly affecting the bonding performance of adhered assemblies. Surface processing was implemented either by peripheral planing with sharp and dull knives, or by sanding (P100). Process-dependent surface textures were visualized by scanning electron microscopy and a digital light microscope was applied to display the structural integrity of surficial wood tissues. In dependence on wood modification techniques, process-related patterns of surface texture were observed. Laser scanning data of surface morphology was used to derive area-related functional roughness parameters defining complex surface textures quantitatively. For tensile shear testing, lamellae were bonded either with a two-component melamine-urea-formaldehyde adhesive or with a one-component moisture-curing polyurethane adhesive. Single lap-joint specimens were prepared following EN 302-1: 2013 by the Deutsches Institut für Normung considering a material-adapted specimen geometry. Bonding strength was evaluated with respect to differentiating regimes of moisture. Specific dependences of modified beech wood properties on surface morphologies subsequent to surface processing and, therewith, on the associated bonding performance could be verified.

As a result, universal relationships between bonding performance and surface processing technique could not be identified. Thus, individual studies of bonding performances in dependence on adherend-and processing-related surface textures are inevitable.

**Accession Number:** WOS:000468335000007

**Conference Title:** International Conference on Wood Adhesives

**Conference Date:** OCT 25-27, 2017

**Conference Location:** Atlanta, GA

**Author Identifiers:**

Author	Web of Science ResearcherID	ORCID Number
Konnerth, Johannes	W-6826-2019	0000-0003-3826-8566

**ISSN:** 0015-7473

#### Record 7 of 38

**Title:** Analysis of sanding parameters on surface properties and coating performance of red oak wood

**Author(s):** Ugulino, B (Ugulino, Bruna); Hernandez, RE (Hernandez, Roger E.)

**Source:** WOOD MATERIAL SCIENCE & ENGINEERING **Volume:** 13 **Issue:** 2 **Pages:** 64-72 **DOI:** 10.1080/17480272.2016.1266511 **Published:** 2018

**Abstract:** Sanding is the most common machining process used to prepare wood surfaces prior to coating. Hence, to improve surface quality and coating performance during this process, an optimal set of machining parameters should be established according to wood species and its final use. The effects of grit size and feed speed on surface properties and coating performance of red oak wood were studied. Surface quality was assessed by surface roughness, scanning electron micrographs, and wetting analyses. Coating performance was evaluated using pull-off adhesion tests on coated surfaces before and after an accelerated weathering. The results showed that smoother surfaces are obtained as the grit size number of the abrasive increased. On the other hand, minor differences were observed on cell damages and surface roughness as feed speed changed. Also, there was little difference among treatments concerning wetting behavior and surface energy. Pull-off strength was more affected by changes in grit size than feed speed. A P100-grit size program with a feed speed of 7 m/min resulted in a suitable roughness which provided good adhesion and high pull-off strength after aging test.

**Accession Number:** WOS:000425812500001

**ISSN:** 1748-0272

**eISSN:** 1748-0280

#### Record 8 of 38

**Title:** Stability of thermosmoothed and precision planed solid wood surfaces

**Author(s):** Molnar, Z (Molnar, Zsolt); Magoss, E (Magoss, Endre); Fuchs, I (Fuchs, Ingrid); Csiha, C (Csiha, Csilla)

**Source:** EUROPEAN JOURNAL OF WOOD AND WOOD PRODUCTS **Volume:** 76 **Issue:** 1 **Pages:** 243-249 **DOI:** 10.1007/s00107-017-1174-y **Published:** JAN 2018

**Abstract:** The outer cell layers of a machined solid wood surface usually collapse and compact during processing due to the cutting forces. This layer is called deformation zone. The deformation zone is excessively instable, varies with temperature and MC variation of the environment. Usual surface investigations like surface roughness or surface tension measurements provide only few and indirect information about the status of the deformation zone, although this is the layer to adhere. Suggestion is made to consider the behaviour of the deformation zone during wetting instead of single parameters, in order to better



characterize the status of the surface and its expected reaction when treated with water based materials. In this research, the focus has been on describing the behavior of the deformation zone of precision planed and thermosmoothed solid wood surfaces during wetting with distilled water. An individual wetting procedure has been developed, whilst surfaces have been characterized by 3D roughness measurement. The evaluation has been performed after defining the convenient roughness parameter as indicator of surface topography changes of the deformation zone due to wetting. Based on indicators sequence has been set among wood species and machining types regarding the answer given by their deformation zone to wetting. Although the two cutting methods offer the smoothest machined surface, their stability to wetting with water differs considerably. The deformation zone of precision planed surfaces has been proven to be more stable than the one of thermosmoothed surfaces. Black locust preserved its stability even when thermosmoothed.

**Accession Number:** WOS:000419447100022  
**ISSN:** 0018-3768  
**eISSN:** 1436-736X

**Record 9 of 38**

**Title:** Evaluation of Selected Properties of Alder Wood as Functions of Sanding and Coating  
**Author(s):** Salca, EA (Salca, Emilia-Adela); Krystofiak, T (Krystofiak, Tomasz); Lis, B (Lis, Barbara)  
**Source:** COATINGS **Volume:** 7 **Issue:** 10 **Article Number:** 176 **DOI:** 10.3390/coatings7100176 **Published:** OCT 2017  
**Abstract:** The objective of this study was to optimize the sanding and coating processes of black alder wood to promote and support its use in furniture manufacturing. Two criteria have been applied for process optimization, namely, the minimum surface roughness of the samples and power consumption during sanding as a function of various sanding systems. The surface roughness of the sanded specimens and the power consumption during sanding strongly depends on the grit size used. Two eco-varnishes were applied to the samples by spraying. Moreover, the effect of the surface preparation and varnish type on the coating properties expressed by the varnish layer adherence to the substrate and surface glossiness was evaluated. For better glossiness values, the UV-cured varnish was preferred. The sanding with a grit sequence of 60, 120, and 150 grit size abrasives was found to be optimal when applied to black alder wood, and it is recommended to obtain performant UV-coated wood surfaces for furniture products.  
**Accession Number:** WOS:000414849800025  
**ISSN:** 2079-6412

**Record 10 of 38**

**Title:** THE EFFECT OF THE POSITION OF 2D ROUGHNESS MEASUREMENT ON THE ROUGHNESS PARAMETERS BY NATURAL WOOD MATERIAL  
**Author(s):** Molnar, Z (Molnar, Zsolt); Nemeth, G (Nemeth, Gabor); Hejja, S (Hejja, Sandor); Magoss, E (Magoss, Endre); Tatai, S (Tatai, Sandor)  
**Source:** WOOD RESEARCH **Volume:** 62 **Issue:** 6 **Pages:** 895-903 **Published:** 2017  
**Abstract:** There are notable differences between the 2-D standardized surface roughness parameters depending on the position of the profil of the surface roughness eavluation of natural wood. Therefore it is fundamental to determine which parameters are the least dependent on the position of the measured profil.  
The dependence of the standardized roughness parameters on the different measuring positions varies. We observed the smallest average dependence at the arithmetic average roughness (P-a) parameter of the P-premary profile, and at the Mr(1) (threshold as the minimal Asperities' height distribution AHD) and Mr(2) (threshold as the maximal AHD) parameters and "reduced" height peak amplitude (P-pk) was more dependent.  
The greatest deviation occurs in the mean roughness depth (P-z), maximum height of the profile (P-t), and the maximum roughness depth (P-max) values. These three parameters whoed the highest differences in function of the measuring positions.  
**Accession Number:** WOS:000424275700007  
**ISSN:** 1336-4561

**Record 11 of 38**

**Title:** Surface Roughness of Medium-Density Fiberboard (MDF) and Edge-Glued Panel (EGP) After Edge Milling  
**Author(s):** Sedlecky, M (Sedlecky, Miroslav)  
**Source:** BIORESOURCES **Volume:** 12 **Issue:** 4 **Pages:** 8119-8133 **DOI:** 10.15376/biores.12.4.8119-8133 **Published:** 2017  
**Abstract:** The mean arithmetic deviation of the roughness profile (Ra) was investigated for the edge surface after edge milling of medium-density fiberboard, medium-density fiberboard with single-sided lamination, and spruce edge-glued panel. Tungsten carbide blades with three different compositions and treatment (HW1, HW2, and HW1 + CrTiN coating) were used. During edge milling, the feed rate (4, 8, and 11 m/min) and cutting speed (20, 30, 40, and 60 m/s) were changed. The lowest roughness values were found in spruce timber, and the highest values were found in untreated MDF. The highest edge surface roughness was measured after using the HW2 tool. Slightly lower values were found using HW1 CrTiN, and the lowest values were found using HW1.  
Increasing the cutting speed led to a very slight increase in roughness. Increasing the feed rate had the same effect, but its effect was more significant. The article provides an understanding of the interaction of the most frequently occurring factors relative to the quality of the work surface of the large-area materials.  
**Accession Number:** WOS:000422879900090  
**ISSN:** 1930-2126

**Record 12 of 38**

**Title:** Some Coating Properties of Black Alder Wood as a Function of Varnish Type and Application Method  
**Author(s):** Salca, EA (Salca, Emilia-Adela); Krystofiak, T (Krystofiak, Tomasz); Lis, B (Lis, Barbara); Mazela, B (Mazela, Bartlomiej); Proszzyk, S (Proszzyk, Stanislaw)  
**Source:** BIORESOURCES **Volume:** 11 **Issue:** 3 **Pages:** 7580-7594 **DOI:** 10.15376/biores.11.3.7580-7594 **Published:** AUG 2016  
**Abstract:** The objective of this study was to evaluate the adhesion strength and glossiness of black alder wood (Alnus glutinosa Gaertn. L.) coated with water-borne and UV varnishes by two application systems. Prior to coating, the samples were prepared by sanding with four combinations of grit size sandpapers, 180 being the final grit. The surface quality of the specimens was measured with a white light profilometer. Any increase in grit size gradually reduced surface roughness, which further influenced the overall coating performance of the samples. UV varnish applied by roller presented higher adhesion strength and gloss as compared to spraying. The specimens varnished with a water-borne finish by spraying exhibited a better adherence to the substrate than those of UV varnished samples by the same method and provided glossiness at 60 degrees geometry in the same range. These results are valuable for the furniture manufacturing industry for generating a better use and efficiency of secondary wood resources in order to achieve value-added products.  
**Accession Number:** WOS:000384922400148  
**Author Identifiers:**

Author	Web of Science ResearcherID	ORCID Number
Mazela, Bartlomiej	D-5534-2015	0000-0003-0138-3034
Krystofiak, Tomasz		0000-0002-2060-0295
Lis, Barbara		0000-0002-3800-8089

**ISSN:** 1930-2126

**Record 13 of 38**

**Title:** Surface Quality of Milled Birch Wood after Thermal Treatment at Various Temperatures

**Author(s):** Kvietkova, M (Kvietkova, Monika); Gaff, M (Gaff, Milan); Gasparik, M (Gasparik, Miroslav); Kaplan, L (Kaplan, Lukas); Barcik, S (Barcik, Stefan)

**Source:** BIORESOURCES **Volume:** 10 **Issue:** 4 **Pages:** 6512-6521 **Published:** NOV 2015

**Abstract:** The surface quality of thermally modified birch wood was examined after plane milling. The surface quality was assessed based on the arithmetic mean deviation of the assessed profile R-a. Plane milling was carried out at various cutting speeds of 20, 40, and 60 m/s and feed speeds 4, 8, and 11 m/min. Based on the results, it was concluded that thermal treatment reduced the surface roughness of milled birch wood, but the decrease was not statistically significant. The cutting speed and feed had the greatest impact on all monitored factors. Increases in cutting speed reduced the average roughness, while increases in feed speed had the opposite effect. The highest roughness was achieved after plane milling with a feed speed of 11 m/min.

**Accession Number:** WOS:000366990800018

**Author Identifiers:**

Author	Web of Science ResearcherID	ORCID Number
Gasparik, Miroslav	F-7704-2015	0000-0002-0537-0815

**ISSN:** 1930-2126

#### Record 14 of 38

**Title:** Simulation in service of young teak wood floors

**Author(s):** Blanco-Florez, J (Blanco-Florez, Jeimy); da Silva, JRM (Moreira da Silva, Jose Reinaldo); Braga, PPD (de Carvalho Braga, Pedro Paulo); Lima, JT (Lima, Jose Tarcisio); Trugilho, PF (Trugilho, Paulo Fernando)

**Source:** MATERIA-RIO DE JANEIRO **Volume:** 20 **Issue:** 4 **Pages:** 1048-1060 **DOI:** 10.1590/S1517-707620150004.0107 **Published:** OCT-DEC 2015

**Abstract:** Hardwood floors has mechanical strength characteristics that allow its use in certain types of traffic. The basic density and hardness of the material are the main wood type of performance indicators, but due to its nature, it is subject to risks, damage by falling objects, drag, wear foot traffic, which affect its aesthetic and performance. Native species from the Amazon are the main used in Brazil for the manufacture of wood floors, however there are species from reforestation with potential use for this type of use. Simulated serving tests constitute an important quality assessment tool wood floors as a way to anticipate the response in terms of performance. In this sense this work was performed in order to evaluate the behavior in service of young hardwood floors *Tectona grandis* and thus support the potential use of this species widely planted in Brazil. There were simulated in-service testing (ASTM D2394-05) by evaluation of resistance to rolling load, indentation applied in small areas, falling-ball indentation, abrasion, friction coefficient, and determining surface roughness. The results showed low resistance to indentation applied in small areas and falling-ball indentation, moderate resistance to rolling load, favorable resistance to abrasion with potential for use in light to moderate traffic for domestic use. Finishing influenced the friction coefficient and surface roughness of wood.

**Accession Number:** WOS:000367346400021

**Author Identifiers:**

Author	Web of Science ResearcherID	ORCID Number
Trugilho, Paulo	W-2508-2019	
Trugilho, Paulo F	I-5613-2013	0000-0002-6230-5462

**ISSN:** 1517-7076

#### Record 15 of 38

**Title:** Evaluation of process parameters for lower surface roughness in wood machining by using Taguchi design methodology

**Author(s):** Tiryaki, S (Tiryaki, Sebahattin); Hamzacebi, C (Hamzacebi, Coskun); Malkocoglu, A (Malkocoglu, Abdulkadir)

**Source:** EUROPEAN JOURNAL OF WOOD AND WOOD PRODUCTS **Volume:** 73 **Issue:** 4 **Pages:** 537-545 **DOI:** 10.1007/s00107-015-0917-x **Published:** JUL 2015

**Abstract:** This paper presents a study of the Taguchi design method for obtaining lower surface roughness values in terms of process parameters in wood machining. The process parameters considered were feed rate, cutting depth, number of knives, annual ring (earlywood-latewood) and grit number of abrasive. The settings of the process parameters were determined by using Taguchi experimental design method. Orthogonal arrays of Taguchi and the signal-to-noise (S/N) ratio were employed to find the optimal levels and to analyze the effect of process parameters on surface roughness. In addition, the Pareto ANOVA analysis was used in order to measure the influence of each process parameter on surface roughness. The results of Taguchi analysis revealed that the most significant variable on surface roughness of both beech and spruce woods by S/N ratio analysis and Pareto ANOVA analysis is the grit number of abrasive. It was also understood that the Taguchi design technique is very suitable to solve the surface quality problem regarding machining of wood species.

**Accession Number:** WOS:000358890200014

**Author Identifiers:**

Author	Web of Science ResearcherID	ORCID Number
Hamzacebi, Coskun	A-3842-2012	0000-0001-6098-3393

**ISSN:** 0018-3768

**eISSN:** 1436-736X

#### Record 16 of 38

**Title:** Study on sanding force and sanding optimal parameters of Manchurian ash

**Author(s):** Xu, MJ (Xu, Meijun); Li, L (Li, Li); Luo, B (Luo, Bin); Xing, FR (Xing, Fangru)

**Source:** European Journal of Wood and Wood Products **Volume:** 73 **Issue:** 3 **Pages:** 385-393 **DOI:** 10.1007/s00107-015-0905-1 **Published:** MAY 2015

**Abstract:** The effects of grit size (40-120), feeding speed (2.5-5.14 m min<sup>-1</sup>), sanding speed (5.35-10.74 m s<sup>-1</sup>) and sanding thickness (0.1-0.5 mm) on sanding force and normal force as well as surface roughness during abrasive belt sanding of Manchurian ash were investigated using orthogonal experiments. The major influencing factors on sanding force and normal force and surface roughness were identified using visual analysis and variance analysis. The sanding force and sanding quality were synthetically evaluated and optimally selected using fuzzy synthetic evaluation. The results showed that sanding force and normal force were significantly affected by all the four factors during sanding of Manchurian ash, especially sanding thickness and feeding speed had greater effect on sanding force and normal force. The optimal parameters for sanding of Manchurian ash were: 40 and 60 mesh of grit size, 2.5 m min<sup>-1</sup> of feeding speed, 10.74 m s<sup>-1</sup> of sanding speed and 0.1 mm of sanding thickness.

**Accession Number:** WOS:000353294300011

**ISSN:** 0018-3768

**eISSN:** 1436-736X

#### Record 17 of 38

**Title:** Effects of sanding parameters on sanding force and normal force in sanding wood-based panels

**Author(s):** Luo, B (Luo, Bin); Li, L (Li, Li); Liu, HG (Liu, Hongguang); Wang, MZ (Wang, Mingzhi); Xu, MJ (Xu, Meijun); Xing, FR (Xing, Fangru)

**Source:** HOLZFORSCHUNG **Volume:** 69 **Issue:** 2 **Pages:** 241-245 **DOI:** 10.1515/hf-2014-0012 **Published:** FEB 2015

**Abstract:** The proper parameters of sanding with abrasive sanding machine are significant to reduce energy consumption and to improve processing efficiency and quality. The parameters sanding speed, feed speed, and granularity have been investigated in terms of the sanding force (sF) and normal force (nF) for particle board (PB) and medium-density fiberboard (MDF). For PB, the sF and nF show decreasing trends of second power with increasing sanding speed and linear increase when feed speed increases. The sF and nF are almost constant when granularity increases from 40 to 80, but these forces show increasing trends of second power when granularity increases from 80 to 150. For MDF, the sF and nF change as trends of second power with increasing sanding speed and increase in trends of second power with increasing feed speed. The sF and nF force decrease when granularity increases from 40 to 80, but these forces present linear increasing trends when granularity increases from 80 to 150.

**Accession Number:** WOS:000348858800015

**ISSN:** 0018-3830

**eISSN:** 1437-434X

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**Record 18 of 38**

**Title:** Effects of cutting parameters on cutting forces and surface quality of black spruce cants

**Author(s):** Hernandez, RE (Hernandez, Roger E.); Llave, AM (Llave, Angela M.); Koubaa, A (Koubaa, Ahmed)

**Source:** EUROPEAN JOURNAL OF WOOD AND WOOD PRODUCTS **Volume:** 72 **Issue:** 1 **Pages:** 107-116 **DOI:** 10.1007/s00107-013-0762-8 **Published:** JAN 2014

**Abstract:** The effects of rake angle, cutting direction, and depth of cut on cutting forces and surface quality of black spruce were evaluated. Cutting forces were measured during cutting at four rake angles (35A degrees, 45A degrees, 55A degrees and 65A degrees), four cutting directions (0A degrees-90A degrees, 15A degrees-75A degrees, 30A degrees-60A degrees, and 45A degrees-45A degrees), and three depths of cut (1, 2, and 3 mm). Torn grain, waviness, and roughness were evaluated. The results showed that as rake angle increased, cutting forces, torn grain, waviness, and roughness decreased. The lowest cutting forces and the best surface quality were obtained with 65A degrees of rake angle. At this angle, cutting forces and surface quality were more affected by depth of cut than by cutting direction variations. Thus, as depth of cut decreased, the effects of cutting orientation on the cutting forces and surface quality decreased. The application of these results to the canting work of a chipper-canter is analyzed.

**Accession Number:** WOS:000329640000014

**Author Identifiers:**

Author	Web of Science ResearcherID	ORCID Number
Koubaa, Ahmed		0000-0002-7895-1901

**ISSN:** 0018-3768

**eISSN:** 1436-736X

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**Record 19 of 38**

**Title:** Effect of the Cutting Speed on the Surface Quality of Black Spruce Cants Produced by a Chipper-Canter

**Author(s):** Hernandez, RE (Hernandez, Roger E.); Kuljich, S (Kuljich, Svetka); Naffeti, O (Naffeti, Oussema); Koubaa, A (Koubaa, Ahmed)

**Source:** FOREST PRODUCTS JOURNAL **Volume:** 63 **Issue:** 1-2 **Pages:** 39-46 **DOI:** 10.13073/FPJ-D-13-00016 **Published:** 2013

**Abstract:** The effect of cutting speed on surface quality of black spruce (*Picea mariana* (Mill) B.S.P.) cants produced by a chipper-canter was evaluated. Four cutting speeds (18.9, 21.3, 24.2, and 27.1 m/s) were tested while feed speed was adjusted to obtain the same nominal chip length of 27.5 mm for each condition. For each speed, 15 logs were processed under frozen and unfrozen wood temperatures using 25 mm of cutting width at their small end. The surface quality was analyzed according to roughness and waviness standard parameters and to the depth of torn grain. The results showed that surface quality was not affected by the cutting speed. In contrast, surface was affected by the temperature of the logs and was better under unfrozen conditions. Quality of cants was also better at the small end of the log and generally at the upper part of the cant.

**Accession Number:** WOS:000327283800006

**Author Identifiers:**

Author	Web of Science ResearcherID	ORCID Number
Koubaa, Ahmed		0000-0002-7895-1901

**ISSN:** 0015-7473

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**Record 20 of 38**

**Title:** Research and Evaluation on the Planning and Sanding Properties of Magnoliaceae glanca Blume Plantation Wood

**Author(s):** Su, CW (Su, Chuwang); Yuan, QP (Yuan, Quanping); Chen, Y (Chen, Yi); Tao, GX (Tao, Guangxu); Yang, J (Yang, Jia)

**Edited by:** Zhang H; Jin D

**Source:** ADVANCED RESEARCH ON MATERIAL ENGINEERING AND ITS APPLICATION **Book Series:** Advanced Materials Research **Volume:** 485 **Pages:** 105-109 **DOI:** 10.4028/www.scientific.net/AMR.485.105 **Published:** 2012

**Abstract:** In this paper, the planning and sanding properties of Magnoliaceae glanca Blume, compared with *Castanopsis hystrix*, were tested. The properties were conducted according to the criteria ASTM D1666-87. The results were shown as follow: the planning and sanding properties of both Magnoliaceae glanca Blume and *Castanopsis hystrix* showed excellent; in the evaluation system for full marks 5 points, the planning marks of both two kinds of wood were 4.7 points, and the sanding marks were separately 5 points and 4.3 points; feeding speed had remarkable influence on the planning properties of both two kinds of wood; cutting thickness had a little influence on the planning property of Magnoliaceae glanca Blume even when planning at a higher feeding speed of 9m/min; the wood quality had important influence on the sanding properties.

**Accession Number:** WOS:000312432700025

**Conference Title:** 2nd International Conference on Information Science, Automation and Material System (ISAM 2012)

**Conference Date:** APR 21-22, 2012

**Conference Location:** Changsha, PEOPLES R CHINA

**Conference Sponsors:** Int Sci & Educ Res Assoc, Beijing Gireida Educ Res Ctr, VIP Informat Conf Ctr

**ISSN:** 1022-6680

**ISBN:** 978-3-03785-374-0

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**Record 21 of 38**

**Title:** Research and Evaluation on the Planning and Sanding Properties of *Toona sinensis*

**Author(s):** Su, CW (Su, Chuwang); Yuan, QP (Yuan, Quanping); Wang, ZK (Wang, Zekun); Chen, H (Chen, Hong); Zeng, FH (Zeng, Fanhua)

**Edited by:** Wu J; Xie H

**Source:** ADVANCED MANUFACTURING TECHNOLOGY AND SYSTEMS **Book Series:** Applied Mechanics and Materials **Volume:** 159 **Pages:** 208-212 **DOI:** 10.4028/www.scientific.net/AMM.159.208 **Published:** 2012

**Abstract:** In this paper, the planning and sanding properties of *Toona sinensis*, compared with *Castanopsis hystrix*, were tested. The properties were conducted according to the criteria ASTM D1666-87. The results show as follow: in the evaluation system for full marks 5 points, the planning marks of *Toona sinensis* and *Castanopsis hystrix* was separately 4.4 points and 4.7 points, and the sanding marks was separately 4.7 points and 4.3 points, slightly different;



the planning and sanding properties of *Toona sinensis* and *Castanopsis hystrix* all show excellent; feeding speed had remarkable influence on the planning properties of *Toona sinensis* and *Castanopsis hystrix*; cutting thickness had different influence on the planning properties of two kinds of woods; the wood quality had important influence on the sanding property.

**Accession Number:** WOS:000310242800039

**Conference Title:** International Conference on Advanced Manufacturing Technology and Systems (AMTS 2012)

**Conference Date:** APR 17, 2012

**Conference Location:** Wuhan, PEOPLES R CHINA

**ISSN:** 1660-9336

**ISBN:** 978-3-03785-387-0

#### Record 22 of 38

**Title:** Effects of Peripheral Planing on Surface Characteristics and Adhesion of a Waterborne Acrylic Coating to Black Spruce Wood

**Author(s):** Cool, J (Cool, Julie); Hernandez, RE (Hernandez, Roger E.)

**Source:** FOREST PRODUCTS JOURNAL **Volume:** 62 **Issue:** 2 **Pages:** 124-133 **Published:** 2012

**Abstract:** Peripheral planing of black spruce (*Picea mariana*) wood was optimized for rake angle and feed speed. Both cutting parameters affected surface characteristics at the microscopic and macroscopic level. In turn, the interaction between rake angle and feed speed had a significant impact on surface roughness, disperse component of surface energy, and total surface energy, as well as on initial pull-off adhesion strength of a waterborne coating. Loss in adhesion during the accelerated aging treatment was significantly lower for samples machined with a rake angle of 10 degrees. This rake angle combined with a wavelength (feed per knife) of 1.3 mm yielded coated surfaces with high initial pull-off strength. Therefore, this wavelength could be used to increase production rates without significantly affecting surface quality. In addition, no torn grain was observed for surfaces prepared with a rake angle of 10 regardless of feed speed.

**Accession Number:** WOS:000309017300007

**ISSN:** 0015-7473

#### Record 23 of 38

**Title:** Research and Evaluation on the Planning and Sanding Properties of *Mytilaria laosensis*

**Author(s):** Su, CW (Su, Chuwang); Yuan, QP (Yuan, Quanping); Su, NC (Su, Ningchuan); Huang, JD (Huang, Jingda)

**Edited by:** Liu XH; Jiang Z; Han JT

**Source:** MATERIALS PROCESSING TECHNOLOGY, PTS 1-3 **Book Series:** Advanced Materials Research **Volume:** 418-420 **Pages:** 982-986 **DOI:** 10.4028/www.scientific.net/AMR.418-420.982 **Part:** 1-3 **Published:** 2012

**Abstract:** In this paper, the planning and sanding properties of *Mytilaria laosensis*, compared with *Castanopsis hystrix*, were tested. The properties were conducted according to the criteria ASTM D1666-87. The results show as follow: the planning and sanding properties of *Mytilaria laosensis* and *Castanopsis hystrix* all show excellent; in the evaluation system for full marks 5 points, the planning marks of *Mytilaria laosensis* and *Castanopsis hystrix* was separately 4.8 points and 4.7 points, and the sanding marks was separately 4.47 points and 4.3 points, so the planning and sanding properties of *Mytilaria laosensis* were slightly better than *Castanopsis hystrix*; feeding speed had remarkable influence on the planning properties of *Mytilaria laosensis* and *Castanopsis hystrix*; The wood quality had important influence on the sanding properties.

**Accession Number:** WOS:000302668300206

**Conference Title:** 2nd International Conference on Advances in Materials and Manufacturing Processes (ICAMMP 2011)

**Conference Date:** DEC 16-18, 2011

**Conference Location:** Guillin, PEOPLES R CHINA

**Conference Sponsors:** Univ Wollongong, NE Univ, Univ Sci & Technol Beijing, Hebei Polytechn Univ

**ISSN:** 1022-6680

**ISBN:** 978-3-03785-326-9

#### Record 24 of 38

**Title:** Roughness models for sanded wood surfaces

**Author(s):** Tan, PL (Tan, P. L.); Sharif, S (Sharif, Safian); Sudin, I (Sudin, Izman)

**Source:** WOOD SCIENCE AND TECHNOLOGY **Volume:** 46 **Issue:** 1-3 **Pages:** 129-142 **DOI:** 10.1007/s00226-010-0382-y **Published:** JAN 2012

**Abstract:** The understanding of the effects of variables is crucial to achieve the desired sanded surface quality at optimum condition. In wood surface evaluation, it is known that anatomies on wood surface could distort the roughness value and cause a misinterpretation of the processing performance. In this study, statistical approaches were taken to characterize the influence of sanding variables as well as to analyze the anatomical noises that were inherited from intra- and inter-species of woods. Four available roughness parameters ( $R(a)$ ,  $R(q)$ ,  $R(k)$  and  $R(ap)$ ) were used to examine the surface of three distinct wood species, viz. kembang semangkok, red oak and spruce in wide-belt sanding. Based on the mean values, analysis of variance showed that species (anatomy) was significant to all conventional parameters except  $R(ap)$  which was filtered by monitoring the second derivative of Abbott-curve. In spite of this,  $R(ap)$  recorded a more widely dispersed deviation of random measurement values than  $R(k)$  and  $R(a)$ . The effects of grit size and feed rate were found to be significant. Empirical roughness models were established using response surface methodology, and the errors were calculated by comparing the model values to all the randomly measured values. Although exhibiting slight species-dependant effect by nature,  $R(k)$  showed reliable consistency by recording the lowest error values (< 10%) for both intra- and inter-species measurements. Experimental results also suggested that three random measurements at each run could be sufficient. The method of constructing machinability models can be readily applied in the industry as a quality control tool for wide-belt sander.

**Accession Number:** WOS:000298993100011

**Author Identifiers:**

Author	Web of Science ResearcherID	ORCID Number
sudin, izman	A-6746-2015	

**ISSN:** 0043-7719

#### Record 25 of 38

**Title:** STUDY ON THE VARIATION OF SANDED SURFACE ROUGHNESS OF BIRCH WOOD

**Author(s):** Fotin, A (Fotin, Adriana); Cismaru, I (Cismaru, Ivan); Cosoreanu, C (Cosoreanu, Camelia); Brenci, LM (Brenci, Luminita Maria)

**Book Group Author(s):** NICOLAE BALCESCU-LAND FORCES ACADEMY

**Source:** 18TH INTERNATIONAL CONFERENCE - THE KNOWLEDGE-BASED ORGANIZATION: APPLIED TECHNICAL SCIENCES AND ADVANCED MILITARY TECHNOLOGIES, CONFERENCE PROCEEDING 3 **Book Series:** Knowledge Based Organization International Conference **Pages:** 54-59 **Published:** 2012

**Abstract:** This paper presents the research results upon the quality of the birch wood surface, after sanding it with grit sizes of 60, 80, 100 and 120. The sanding operation was performed on three different directions: parallel, perpendicular and inclined at 45 to the grains direction. During this research, the quality of the sanded surfaces obtained after combining the four grit sizes in six sanding technologies is analyzed. The sanding samples were prepared in the

industrial regime at NIKMOB Company from Nehoiu, on the wide belt sander machine equipped with electronic device. The variable parameters of the sanding process were: feed speed and cutting depth. In order to determine the number of samples, the factorial experiment for two variables was applied. The surface roughness measurement was done perpendicularly to the processing directions using the light beam roughness equipment, MicroProof FRT type. Three roughness parameters: Ra, Rk and Rpk were analyzed in order to assess the quality of the surface. The results of this study have practical applicability in furniture production where specialists can extend the use of birch wood if they know how to combine parameters of sanding to obtain high quality surfaces.

**Accession Number:** WOS:000393448300009

**Conference Title:** 18th International Conference on Knowledge-Based Organization (KBO 2012)

**Conference Date:** JUN 14-16, 2012

**Conference Location:** Sibiu, ROMANIA

**Conference Sponsors:** Nicolae Balcescu Land Forces Acad

**ISSN:** 1843-6722

#### Record 26 of 38

**Title:** PERFORMANCE OF THREE ALTERNATIVE SURFACING PROCESSES ON BLACK SPRUCE WOOD AND THEIR EFFECTS ON WATER-BASED COATING ADHESION

**Author(s):** Cool, J (Cool, Julie); Hernandez, RE (Hernandez, Roger E.)

**Source:** WOOD AND FIBER SCIENCE **Volume:** 43 **Issue:** 4 **Pages:** 365-378 **Published:** OCT 2011

**Abstract:** Surface quality and water-based coating performance of samples prepared by oblique cutting, helical planing, and face milling were studied. Oblique cutting and helical planing generated surfaces with similar features. Samples had little subsurface damage and fibrillation, and few cell lumens were accessible on the surface to favor coating penetration. As a result, these samples had lower surface roughness and wetting properties than face-milled ones. Face-milled samples were defined by more subsurface damage, fibrillation, and open lumens that favored coating penetration. However, the pull-off strength of face-milled samples was significantly lower after accelerated weathering than the oblique-cut or helical-planed samples. Hence, oblique cutting and helical planing are suitable for preparing surfaces of black spruce prior to coating application. No correlations were detected between surface quality parameters and adhesion, which indicates that pull-off tests have to be determined to quantify coating adhesion on surfaces of this wood species.

**Accession Number:** WOS:000296406100004

**ISSN:** 0735-6161

#### Record 27 of 38

**Title:** The effect of the process parameters in the planing processes on the surface roughness of cherry and pear woods

**Author(s):** Sogutlu, C (Sogutlu, Cevdet); Togay, A (Togay, Abdullah)

**Source:** AFRICAN JOURNAL OF BIOTECHNOLOGY **Volume:** 10 **Issue:** 21 **Pages:** 4392-4399 **Published:** MAY 23 2011

**Abstract:** In this study, the effects of the process parameters in the planing processes on the surface roughness were investigated. For this purpose, the experimental samples of cherry (*Prunus avium* L.) and pear (*Pirus communis* L.) wood species, which are commonly used in the Turkish decoration industry, were prepared. In preparing the experimental samples, the wood was planed tangentially and radially to the annual rings at a cutting depth of 1.4 mm in a milling machine with 4 blades 85 mm in diameter. The wood was planed into the direction of spindle rotation and in the direction against the spindle rotation at feed rates of 6, 9 and 12 m/min. The surface roughness values of the experimental samples were determined by using a stylus-type profilometer according to the ISO 4287 standards. The surface roughness was evaluated according to the R-a, R-z and R-y principles, which were three basic parameters of the determination method for surface roughness. According to the results, when the planing parameters were differentiated, the obtained surface roughness values also acquired a different character. The feed direction of work pieces for planing in the direction of spindle rotation was lower than the feed direction in the opposite to spindle rotation for the surface roughness.

**Accession Number:** WOS:000294612400011

**ISSN:** 1684-5315

#### Record 28 of 38

**Title:** EVALUATION OF FOUR SURFACING METHODS ON BLACK SPRUCE WOOD IN RELATION TO POLY(VINYL ACETATE) GLUING PERFORMANCE

**Author(s):** Cool, J (Cool, Julie); Hernandez, RE (Hernandez, Roger E.)

**Source:** WOOD AND FIBER SCIENCE **Volume:** 43 **Issue:** 2 **Pages:** 194-205 **Published:** APR 2011

**Abstract:** Oblique cutting, peripheral planing, face milling, and sanding were used to surface black spruce wood prior to gluing with a two-component poly(vinyl acetate) adhesive. Surface roughness, anatomical features of surfaces, and glueline interfaces as well as the glueline shear strength before and after aging were evaluated. Oblique-cut surfaces presented no subsurface damage, little fibrillation, low roughness, thin gluelines, and little adhesive penetration. Peripheral-planed and face-milled surfaces both showed slight cell deformation and a higher level of fibrillation. The large number of cell lumens available and the fibrillation appeared to favor the penetration of adhesive as well as to increase surface roughness. Sanded surfaces were the smoothest, and their anatomical structures were the least visible of the four machining processes. These samples also showed more important subsurface damage, which limited the penetration of adhesive. For the glueline shear strength before and after weathering, no significant differences occurred among the surfacing treatments. The microscopic and topographic differences among the surfacing treatments were not sufficient to generate significant differences in glueline shear strength. Peripheral planing and face milling should be better alternatives with respect to productivity.

**Accession Number:** WOS:000290834700009

**ISSN:** 0735-6161

#### Record 29 of 38

**Title:** Improving the Sanding Process of Black Spruce Wood for Surface Quality and Water-Based Coating Adhesion

**Author(s):** Cool, J (Cool, Julie); Hernandez, RE (Hernandez, Roger E.)

**Source:** FOREST PRODUCTS JOURNAL **Volume:** 61 **Issue:** 5 **Pages:** 372-380 **DOI:** 10.13073/0015-7473-61.5.372 **Published:** 2011

**Abstract:** The sanding of black spruce wood prior to coating application was optimized for feed speed and grit size. As feed speed increased, the surface roughness and the surface energy of the samples increased. For the different sanding programs, reductions of the surface roughness and the contact angles were observed with a finer grit abrasive. The initial pull-off strength was statistically similar regardless of the feed speed and grit size. However, both the feed speed and the grit size affected coating adhesion following the accelerated weathering treatment. Because there was no correlation between the surface quality parameters and the pull-off strength, the latter had to be measured to determine coating performance on black spruce wood. In the present work, a two-stage sanding program combined with a feed speed of 17 m/min resulted in good surface quality and pull-off strength.

**Accession Number:** WOS:000302209600006

**ISSN:** 0015-7473

#### Record 30 of 38

**Title:** EXPERIMENTAL RESEARCH UPON THE ROUGHNESS OF THE BIRCH WOOD SURFACES PROCESSED BY STRAIGHT MILLING

**Author(s):** Fotin, A (Fotin, Adriana); Cismaru, I (Cismaru, Ivan); Cosoreanu, C (Cosoreanu, Camelia); Brenci, LM (Brenci, Luminita Maria)

**Book Group Author(s):** Nicolae Balcescu Land Forces Acad

**Source:** 17TH INTERNATIONAL CONFERENCE - THE KNOWLEDGE-BASED ORGANIZATION: APPLIED TECHNICAL SCIENCES AND ADVANCED MILITARY TECHNOLOGIES, CONFERENCE PROCEEDING 3 **Book Series:** Knowledge Based Organization International Conference **Pages:** 63-68 **Published:** 2011



**Abstract:** This paper presents a comparative study concerning the quality of the surface resulted after longitudinal processing of birch wood using two cutters with removable plates made of SMC (sintered metal carbide), and two cutters with brazable plates. The variable processing parameters are as follows: cutter diameter, speed, feed speed, and cutting depth. The samples were processed by the four cutters on the vertical milling machine MNF10 type, provided with a mechanical feed device. The research was based on the assessment of the quality of the processed surfaces by a comparative analysis of the roughness parameters Ra, Rk and Rpk resulted from the roughness measurements along the cutting direction using a German FRT (Fries Research Technology) type optical profilometer. As a conclusion of the experimental research, the best surfaces obtained by longitudinal milling are obtained when using cutters with larger diameters and removable plates made of SMC. The results of this research were used to optimise the processing system through which the best surfaces may be obtained. Thus, the attitude of wood engineering specialists regarding the use of birch wood (*Betula pendula*) could be changed by promoting its use on an extensive scale and offering the possibility of broadening the raw material range of our country.

**Accession Number:** WOS:000393448400010

**Conference Title:** 17th International Conference on the Knowledge-Based Organization (KBO 2011)

**Conference Date:** NOV 24-26, 2011

**Conference Location:** Sibiu, ROMANIA

**Conference Sponsors:** Nicolae Balcescu Land Forces Acad

**ISSN:** 1843-6722

#### Record 31 of 38

**Title:** The Effect of the Sanding Time and Abrasive Grit Size on Surface Roughness of Pine (*Pinus Sylvestris*) Wood

**Author(s):** Cikanas, K (Cikanas, K.); Keturakis, G (Keturakis, G.)

**Edited by:** Baksys B; Bargelis A; Jonusas R; Bockus S; Leonavicius M; Ziliukas A; Dundulis R; Pilkaite T

**Source:** MECHANIKA 2011: PROCEEDINGS OF THE 16TH INTERNATIONAL CONFERENCE **Book Series:** Mechanika Kaunas University of Technology **Pages:** 67-+ **Published:** 2011

**Abstract:** This paper presents the research results, which show how the roughness of surface of pine (*Pinus sylvestris*) wood is changing with increase of sanding time and abrasive grit size. The samples were sanded in the eccentric sanding stand using abrasive grit of three different sizes (macrogrits P80, P120 and P180) and two sanding speeds (4000 and 6400 min<sup>-1</sup>). The parameters of surface roughness of processed samples R-a, R-z and R-max were measured by contact profilometer on five sectors. The roughness in each sector was measured along, at the 45 degrees angle and across the grain direction. The received measurement results were processed by Gaussian digital filter. The received results helped to determine dependences between surface roughness and sanding time, abrasive grit size and sanding speed of the tool.

**Accession Number:** WOS:000333478000013

**Conference Title:** 16th International Conference on Mechanika

**Conference Date:** APR 07-08, 2011

**Conference Location:** Kaunas Univ Technol, Kaunas, LITHUANIA

**Conference Sponsors:** Kaunas Univ Technol, Lithuanian Acad Sci, IFToMM Natl Comm Lithuania, Baltic Assoc Mech Engr

**Conference Host:** Kaunas Univ Technol

**ISSN:** 1822-2951

#### Record 32 of 38

**Title:** EFFECT OF CUTTING WIDTH AND CUTTING HEIGHT ON THE SURFACE QUALITY OF BLACK SPRUCE CANTS PRODUCED BY A CHIPPER-CANTER

**Author(s):** Hernandez, RE (Hernandez, Roger E.); Kuljich, S (Kuljich, Svetka); Koubaa, A (Koubaa, Ahmed)

**Source:** WOOD AND FIBER SCIENCE **Volume:** 42 **Issue:** 3 **Pages:** 273-284 **Published:** JUL 2010

**Abstract:** The effects of the cutting height and cutting width on the surface quality of black spruce cants produced by a chipper-canter were evaluated. Three diameter classes (102, 152, and 203 mm dia as measured at the small end of the log) were studied, each processed using two cutting widths (12.5 and 25 mm). The rotation and feed speeds, kept constant at 783 rpm and 197 m/min, respectively, yielded a nominal feed per knife (chip length) of 31.5 mm. Twelve logs for each cutting condition were processed under frozen and unfrozen wood temperatures (winter and summer). The surface quality was analyzed using roughness and waviness standard parameters. Torn grain was evaluated by means of its maximum depth. The results showed that surface quality was affected by cutting height, cutting width, and temperature of logs. In general, surface quality was better when processing unfrozen logs at lower cutting width and height. Surface quality also varied within the cant, being generally better at the small end of the log and at the upper part of the cant. The results give useful information to improve the performance of the chipper-canter in terms of surface quality.

**Accession Number:** WOS:000280452900003

**Author Identifiers:**

Author	Web of Science ResearcherID	ORCID Number
Koubaa, Ahmed		0000-0002-7895-1901

**ISSN:** 0735-6161

#### Record 33 of 38

**Title:** THE TOOL INFLUENCE ON THE QUALITY OF THE BIRCH WOOD STRAIGHT MILLED SURFACES

**Author(s):** Fotin, A (Fotin, A.); Cismaru, I (Cismaru, I); Cismaru, M (Cismaru, M.); Cosereanu, C (Cosereanu, C.); Brenci, LM (Brenci, L. M.); Curtu, I (Curtu, I)

**Edited by:** Kyttner R

**Source:** PROCEEDINGS OF THE 7TH INTERNATIONAL CONFERENCE OF DAAAM BALTIC INDUSTRIAL ENGINEERING, VOLS 1 AND 2 **Pages:** 269-+ **Published:** 2010

**Abstract:** The paper presents the results on the quantitative assessment of the quality of the straight edge surfaces when longitudinally and transversally milling the birch wood surfaces using two types of milling cutters of 80 mm diameter: one with removable metal inserts and one with brazable inserts. Variable parameters as processing direction, rotative speed, feed speed, cutting height and the milling width were considered. The results prove that a better quality of the surface is obtained when milling it with cutters with removable metal inserts. The final conclusion may contribute to the rehabilitation of the *Betula pendula* (birch wood) status, by changing the attitude of the specialists regarding the possibilities of using it on a large scale in industry.

**Accession Number:** WOS:000290548900044

**Conference Title:** 7th International Conference of DAAAM Baltic Industrial Engineering

**Conference Date:** APR 22-24, 2010

**Conference Location:** Tallinn, ESTONIA

**Conference Sponsors:** DAAAM Int Vienna, BALTECH Consortium, Estonian Acad Sci, Fed Estonian Engr Ind, Assoc Estonian Mech Engr

**ISBN:** 978-9985-59-982-2

#### Record 34 of 38

**Title:** THE EFFECT OF THE FEEDING DIRECTION AND FEEDING SPEED OF PLANING ON THE SURFACE ROUGHNESS OF ORIENTAL BEECH AND SCOTCH PINE WOODS

**Author(s):** Sogutlu, C (Sogutlu, Cevdet)

**Source:** WOOD RESEARCH **Volume:** 55 **Issue:** 4 **Pages:** 67-77 **Published:** 2010

**Abstract:** The objective of this study is to determine the effect of the feeding direction and feeding speed of planing on the surface roughness of the Oriental beech (*Fagus orientalis* L.) and Scotch pine (*Pinus silvestris* L.) wood species grown in the Black Sea Region of Turkey. When preparing the specimens, the wood was planed tangentially and radially to the annual rings at a cutting depth of 1.4 mm in a milling machine with 4 blades and an 85 mm diameter. The wood was planed in the direction of spindle rotation and in the direction opposite of the spindle rotation at feeding speeds of 6 m.min<sup>-1</sup>, 9 m.min<sup>-1</sup>, and 12 m.min<sup>-1</sup> and a rotation speed of about 7200 rpm. The surface roughness values of the specimens were determined by using a stylus-type profilometer according to the ISO 4287 standards. The surface roughness was evaluated according to the R-a, R-z, and R-y principles, which are three basic parameters. The results showed that smoother surfaces could be obtained in the planing realized by feeding in spindle rotation. Furthermore, the tangential direction produced smoother surfaces compared to the radial direction and as the feeding speed increased, the surface roughness also increased.

**Accession Number:** WOS:000287643700007

**ISSN:** 1336-4561

#### Record 35 of 38

**Title:** SURFACE CHARACTERISTICS OF OVERLAID WOOD COMPOSITES

**Author(s):** Hizirolu, S (Hizirolu, S.); Suzuki, S (Suzuki, S.)

**Source:** JOURNAL OF TROPICAL FOREST SCIENCE **Volume:** 21 **Issue:** 3 **Pages:** 272-276 **Published:** JUL 2009

**Abstract:** HIZIROGLU S & SUZUKI S. 2009. Surface characteristics of overlaid wood composites. In this study, surface characteristics of commercially manufactured overlaid medium density fibreboard (MDF) and particleboard panels were evaluated. Roughness was measured randomly from the surface of overlaid samples conditioned at 55 and 93% relative humidity (RH) levels using a fine stylus profilometer. Three roughness parameters, namely, average roughness (R(a)), mean peak-to-valley height (R(z)) and maximum roughness were used to determine surface profiles of samples. Statistical analysis revealed that no significant difference was found between roughness values of MDF and particleboard panels exposed to 55% RH. However, when samples were exposed to 93% RH, significant difference between initial and final roughness values was observed. Janka hardness values of samples exposed to 93% RH were significantly lower than those exposed to 55% RH. It appears that roughness of overlaid samples due to humidity exposures can be quantified using stylus type equipment and such data along with hardness characteristics may be used to improve overall quality of panels for further processes.

**Accession Number:** WOS:000268897800012

**ISSN:** 0128-1283

#### Record 36 of 38

**Title:** Effect of sanding on surface roughness of rubberwood

**Author(s):** Sulaiman, O (Sulaiman, O.); Hashima, R (Hashima, R.); Subari, K (Subari, K.); Liang, CK (Liang, C. K.)

**Source:** JOURNAL OF MATERIALS PROCESSING TECHNOLOGY **Volume:** 209 **Issue:** 8 **Pages:** 3949-3955 **DOI:** 10.1016/j.jmatprotec.2008.09.009 **Published:** APR 21 2009

**Abstract:** The objective of this research was to study the effect of sanding on surface roughness of rubberwood. Surface roughness was measured using stylus profilometer. Sessile water drop technique was used to determine contact angle of the surface. The results indicated that sanding process could improved surface roughness. Lower grit size gave rougher surface. The radial surface of rubberwood was found to be rougher compared to tangential surface. The roughness value across the grain was higher compared to the longitudinal section. The contact angle on the tangential surface was higher compared to the radial surface and this indicated that the radial surface was rougher than the tangential surface. (C) 2008 Published by Elsevier B.V.

**Accession Number:** WOS:000266121100030

**Author Identifiers:**

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**ISSN:** 0924-0136

#### Record 37 of 38

**Title:** Method for evaluating the influence of wood machining conditions on the objective characterization and subjective perception of a finished surface

**Author(s):** Coelho, CL (Coelho, Cristina L.); Carvalho, LMH (Carvalho, Luisa M. H.); Martins, JM (Martins, Jorge M.); Costa, CAV (Costa, Carlos A. V.); Masson, D (Masson, Daniel); Meausoone, PJ (Meausoone, Pierre-Jean)

**Source:** WOOD SCIENCE AND TECHNOLOGY **Volume:** 42 **Issue:** 3 **Pages:** 181-195 **DOI:** 10.1007/s00226-007-0166-1 **Published:** MAR 2008

**Abstract:** A method for evaluating the influence of the operating parameters of wood machining (planing, sanding) on the quality of a finished surface was established. The influence of each of the operations involved was studied using different strategies. For the planing operation, three levels were established (Level 1, 2 and 3) by determining different values for each of the major process parameters (tool rotation speed, feed speed, depth of cut). For both, surface preparation and polishing, two levels were established with a fixed setup. Finally, as finishing products, two different transparent coatings were selected (water-borne and solvent-borne). The quantitative evaluation of the state of the surface was assessed by means of an artificial vision system for the determination of the pseudo-roughness of wood surfaces. A filtering method based on fast Fourier transforms was applied and it was possible to derive three criteria for evaluating the resulting profile.

**Accession Number:** WOS:000254208100001

**Author Identifiers:**

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Martins, Jorge Manuel		0000-0003-2200-0709

**ISSN:** 0043-7719

#### Record 38 of 38

**Title:** Determination of the thermal conductivity of wood by the hot plate method: The influence of morphological properties of fir wood (*Abies alba* Mill.) to the contact thermal resistance

**Author(s):** Bucar, B (Bucar, Bojan); Straze, A (Straze, Ales)

**Source:** HOLZFORSCHUNG **Volume:** 62 **Issue:** 3 **Pages:** 362-367 **DOI:** 10.1515/HF.2008.021 **Published:** 2008

**Abstract:** Thermal conductivity is frequently determined by the hot plate method. The influence of the anatomical and morphological properties of fir wood (*Abies alba* Mill.) was studied on the hot plate method and the mechanical treatment on the contact thermal resistance of the surface was addressed. It was confirmed that there is a contact thermal resistance between the surface of a specimen and the smoother metal plate of an experimental device. It amounted to 3.04 x 10<sup>-3</sup> m<sup>2</sup>K W<sup>-1</sup> in the direction of wood fibres and, similarly, 2.96 x 10<sup>-3</sup> m<sup>2</sup>K W<sup>-1</sup> in the transverse direction. A negligible contact thermal

resistance - maximal 9% of the contact thermal resistance between the wood specimen and the metal plate - was determined at the contact of two wood surfaces. It is ascribed to the better fit of two wood surfaces compared to the fit of the wood surface with a smoother metal one. Irreversible morphological changes were determined in the real surface layers of mechanically treated test specimens. Abbot curves of real bearing profiles were additionally prepared, where the equality of longitudinal and transverse wood surfaces, as well as a sigmoid increase of bearing surface towards the inner wood tissue of test specimens was confirmed. The inverse proportional relation between the contact thermal resistance and the contact surface of wood was ascertained. The thermal conductivity of the combined and reintegrated composite of solid wood was invariable.

**Accession Number:** WOS:000255555600017

**ISSN:** 0018-3830

**eISSN:** 1437-434X

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**Record 1 of 4****Title:** The Effect of the Sanding Time and Abrasive Grit Size on Surface Roughness of Pine (*Pinus Sylvestris*) Wood**Author(s):** Cikanas, K (Cikanas, K.); Keturakis, G (Keturakis, G.)**Edited by:** Baksys B; Bargelis A; Jonusas R; Bockus S; Leonavicius M; Ziliukas A; Dundulis R; Pilkaite T**Source:** MECHANIKA 2011: PROCEEDINGS OF THE 16TH INTERNATIONAL CONFERENCE **Book Series:** Mechanika Kaunas University of Technology **Pages:** 67-+ **Published:** 2011**Abstract:** This paper presents the research results, which show how the roughness of surface of pine (*Pinus sylvestris*) wood is changing with increase of sanding time and abrasive grit size. The samples were sanded in the eccentric sanding stand using abrasive grit of three different sizes (macrogrits P80, P120 and P180) and two sanding speeds (4000 and 6400 min<sup>-1</sup>). The parameters of surface roughness of processed samples R-a, R-z and R-max were measured by contact profilometer on five sectors. The roughness in each sector was measured along, at the 45 degrees angle and across the grain direction. The received measurement results were processed by Gaussian digital filter. The received results helped to determine dependences between surface roughness and sanding time, abrasive grit size and sanding speed of the tool.**Accession Number:** WOS:000333478000013**Conference Title:** 16th International Conference on Mechanika**Conference Date:** APR 07-08, 2011**Conference Location:** Kaunas Univ Technol, Kaunas, LITHUANIA**Conference Sponsors:** Kaunas Univ Technol, Lithuanian Acad Sci, IFToMM Natl Comm Lithuania, Baltic Assoc Mech Engr**Conference Host:** Kaunas Univ Technol**ISSN:** 1822-2951**Record 2 of 4****Title:** EXPERIMENTAL RESEARCH UPON THE ROUGHNESS OF THE BIRCH WOOD SURFACES PROCESSED BY STRAIGHT MILLING**Author(s):** Fotin, A (Fotin, Adriana); Cismaru, I (Cismaru, Ivan); Cosoreanu, C (Cosoreanu, Camelia); Brenci, LM (Brenci, Luminita Maria)**Book Group Author(s):** Nicolae Balcescu Land Forces Acad**Source:** 17TH INTERNATIONAL CONFERENCE - THE KNOWLEDGE-BASED ORGANIZATION: APPLIED TECHNICAL SCIENCES AND ADVANCED MILITARY TECHNOLOGIES, CONFERENCE PROCEEDING 3 **Book Series:** Knowledge Based Organization International Conference **Pages:** 63-68 **Published:** 2011**Abstract:** This paper presents a comparative study concerning the quality of the surface resulted after longitudinal processing of birch wood using two cutters with removable plates made of SMC (sintered metal carbide), and two cutters with brazable plates. The variable processing parameters are as follows: cutter diameter, speed, feed speed, and cutting depth. The samples were processed by the four cutters on the vertical milling machine MNF10 type, provided with a mechanical feed device. The research was based on the assessment of the quality of the processed surfaces by a comparative analysis of the roughness parameters Ra, Rk and Rpk resulted from the roughness measurements along the cutting direction using a German FRT (Fries Research Technology) type optical profilometer. As a conclusion of the experimental research, the best surfaces obtained by longitudinal milling are obtained when using cutters with larger diameters and removable plates made of SMC. The results of this research were used to optimise the processing system through which the best surfaces may be obtained. Thus, the attitude of wood engineering specialists regarding the use of birch wood (*Betula pendula*) could be changed by promoting its use on an extensive scale and offering the possibility of broadening the raw material range of our country.**Accession Number:** WOS:000393448400010**Conference Title:** 17th International Conference on the Knowledge-Based Organization (KBO 2011)**Conference Date:** NOV 24-26, 2011**Conference Location:** Sibiu, ROMANIA**Conference Sponsors:** Nicolae Balcescu Land Forces Acad**ISSN:** 1843-6722**Record 3 of 4****Title:** SURFACE CHARACTERISTICS OF OVERLAID WOOD COMPOSITES**Author(s):** Hiziroglu, S (Hiziroglu, S.); Suzuki, S (Suzuki, S.)**Source:** JOURNAL OF TROPICAL FOREST SCIENCE **Volume:** 21 **Issue:** 3 **Pages:** 272-276 **Published:** JUL 2009**Abstract:** HIZIROGLU S & SUZUKI S. 2009. Surface characteristics of overlaid wood composites. In this study, surface characteristics of commercially manufactured overlaid medium density fibreboard (MDF) and particleboard panels were evaluated. Roughness was measured randomly from the surface of overlaid samples conditioned at 55 and 93% relative humidity (RH) levels using a fine stylus profilometer. Three roughness parameters, namely, average roughness (R(a)), mean peak-to-valley height (R(z)) and maximum roughness were used to determine surface profiles of samples. Statistical analysis revealed that no significant difference was found between roughness values of MDF and particleboard panels exposed to 55% RH. However, when samples were exposed to 93% RH, significant difference between initial and final roughness values was observed. Janka hardness values of samples exposed to 93% RH were significantly lower than those exposed to 55% RH. It appears that roughness of overlaid samples due to humidity exposures can be quantified using stylus type equipment and such data along with hardness characteristics may be used to improve overall quality of panels for further processes.**Accession Number:** WOS:000268897800012**ISSN:** 0128-1283**Record 4 of 4****Title:** Roughness evaluation of machined surfaces of wood**Author(s):** Okuwura, S (Okuwura, Shogo); Fujiwara, Y (Fujiwara, Yuko)**Source:** MOKUZAI GAKKAISHI **Volume:** 53 **Issue:** 4 **Pages:** 173-179 **Published:** 2007**Abstract:** Roughness of machined surfaces of wood has been studied for a long time, since it is an important measure for evaluating the machining process employed and the quality of machined products. It is, however, not so easy to measure or evaluate the roughness, because the surface texture of wood is composed of anatomical roughness as well as the roughness due to processing. This paper introduces the outline of the standards for roughness measurement that have recently been revised completely. It also reviews the studies of the latest decade on roughness evaluation of machined surfaces of wood from the points of view such as roughness measurement including signal processing, evaluation of roughness due to processing, and roughness evaluation based on tactility.**Accession Number:** WOS:000249613100001**ISSN:** 0021-4795**eISSN:** 1880-7577

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